Timing of Household Travel Surveys

The following is a synopsis of the contributions and responses regarding the appropriate nature and timing of travel survey programs during periods of local or national change. Potential solutions and alternative survey approaches such as, panel surveys are also reviewed. The synthesis represents contributions made to the e-mail list during October 2008. The discussion is augmented with select contributions made during two separate seminars on the Virtual Mentoring Technical Service Center (VMTSC) in late October and early November.

Introduction

One of the more important foundations for the development of any travel demand model is obtaining a basic understanding of the dynamics of urban area residential travel that can be collected through household travel surveys. Additional critical data worth obtaining includes information on urban goods movement or commercial vehicle travel as well as the impact of external trip travel patterns which are acquired via other travel survey instruments. Travel surveys provide a substantial amount of information regarding travel behavior, including but not limited to, why travel occurs, the activity, the frequency, cost, mode, and trip length in addition to person and household characteristics of the traveler. Thus, the resulting travel survey data comprises key inputs and calibration benchmarks in the development of travel models.

More importantly the timing of a regional data collection program can be critical with respect to future demand forecasts. As noted by a participant, *when* the survey is conducted can potentially raise credibility concerns regarding the defensibility of the data and the model. Given the unstable economy and changing fuel prices, what can be done to reduce concerns about moving forward with household and other travel surveys? And, what should agencies consider in developing their regional data collection programs? These two questions are the foundation of the e-mail discussion synthesized below.

Key Discussion Issues

Participants overwhelming conclude that given the uncertain nature of socio-economic conditions, there never really is a truly “opportune” time to conduct travel surveys. According to one contributor, “there is no time when travel is stabilized,” given the influence of external forces. Several contributors noted the lack of accurate anticipation associated with recent events such as the financial turmoil, housing problems, and elevated gas prices as evidence of anyone’s ability to accurately predict future conditions when budgeting and constructing a travel survey program. As noted by a contributor to the discussion, a survey that is conducted every 10 years may “miss the boat” on unique events; or, conversely, the survey may unduly capture a unique occurrence which may have unintended consequences with respect to model results.

As noted, cross-sectional household surveys offer a “snap-shot” of participant’s travel at the time the data was collected. Several contributors felt that traditional cross-sectional household survey’s may not be able to capture temporary or permanent changes due to external forces or changes in the region’s transportation infrastructure because of the infrequent nature of these data collection efforts. Consequently, several questions and concerns were raised regarding traditional survey programs. These include:

- Data collected episodically (e.g. periods of 5, 10 and 15 years can exist between regional data collection efforts),
- Insufficient data to conduct meaningful analysis of responses to socio-economic change (e.g. external factors may be ignored or undocumented),
- Large “one-time” budgetary cost,

- Privacy issues and the intrusive nature of surveys that may lead to reliability concerns associated with the information obtained from travel surveys (e.g. this may influence bad transportation planning decisions),
- Proliferation of cell-phone only households (e.g. call-back interview issues).

Potential Solutions and Considerations

At issue is creating a dataset that represents an event either before or after it has occurred and whether the event represents a true temporal alteration of long term trends or simply represents a one-time event (short or relatively protracted). Therefore and as recommended by more than one contributor, travel surveys should be collected when the data need is apparent and the money is available in the budget to move forward. Relevant knowledge of existing models, past data collection efforts, and reasonable judgments regarding future model expectations should help form the basis of how frequent and how large the data collection efforts should be according to one contributor. As suggested by another contributor, documenting average fuel prices, local and national unemployment rates, and average housing prices at the time of the survey can offer relevant and timely information regarding exogenous events that occurred at the time of the data collection effort.

The timing of regional data collection programs is obviously critical and not only in the context of large scale socio-economic cycles. Several contributors highlighted local events as examples of occurrences that could influence travel survey results. Regional transportation events, such as the opening of a significant toll road or transit fare changes, may warrant delaying the onset of travel survey collection programs. By delaying the survey, the planning agency could, in theory, have datasets that represent the before and after conditions associated with the implementation of the regional transportation projects.

For small-to-medium sized study areas continual or episodic data collection efforts may not be very realistic given budgetary constraints and timelines. One pragmatic solution offered was to conduct frequent model validations and updates to track model results as a means to address and monitor influences on travel and therefore comparative model results. Interim year forecasts could be used to verify baseline conditions or determine that the base year events were a one-time aberration or trend. As one contributor added, “a near-term ‘model verification’ exercise could offer insights about the uncertainty of a longer-range forecast.”

For instances when the travel survey program has been interrupted or postponed due to a unique event, one suggestion offered was that trip rates or portions of the model structure from other regions could be borrowed and the agency could, “focus on other areas to collect data needed to validate a model rather than estimate a new model set.”

Potential Opportunities

A panel survey, unlike the traditional cross-sectional sample surveys, is not a one-time data collection effort. Panel survey participants agree to be surveyed over many years. Information is collected in “waves” with the period in-between waves measured in months or years. Therefore, panel surveys have the potential to accurately capture the changes that occur as a result of socio-economic changes.

The concept of implementing panel surveys for non-marketing purposes, such as capturing behavior associated with transportation decisions, is relatively new to the United States. There are limited examples in the United States. The Puget Sound Transportation Panel (PSTP), which began in 1989, is the most frequently cited example in the United States. Several contributors noted the planned panel survey in the state of Ohio as a long anticipated event in

the survey and transportation communities. The Ohio panel survey will be augmented with a supplemental and concurrent global positioning satellite (GPS) data collection effort. As one contributor specifically noted about this example, "this allows for the collection of multi-day data, which could further illuminate the effects of short-run perturbations in society and the economy."

Conversely, the international community has greater experience with the practice of panel surveys. Examples noted by contributors to the discussion included the German Mobility Panel, which uses a 3-year rotational design to reduce attrition concerns, and the Sydney Continuous Household Travel Survey. The cited benefits of the rotational design in Germany include:

- Reduces conditioning effects in panel members, and
- Enhances the sustainability of the panel.

Another advantage of continuous surveys, according to one participant, is it obviates the need to periodically, "request a one-off substantial budget survey."

The largest drawback to panel surveys is attrition, which is realized through participation disinterest, panel members moving out of the study area, and panel households changing and eventually contact is lost with that household. A few contributors noted that obtaining and sustaining the proper sample size raises several statistical and sampling concerns.

Conclusions

As noted by one contributor, traditional surveys may not be perfect, just like traffic counters and other data sources. However, there are many years of research and implementation practice that lends credence to these types of survey instruments. The data is also available in a relatively short time period, upon the completion of the survey, whereas complete longitudinal survey data requires a number of additional years of data collection.

There are many salient benefits to capturing time sensitive information with respect to travel demand modeling. Currently, there is very limited experience in the United States as to what to do with information generated by longitudinal panel surveys and how to incorporate this information into travel demand models. Based on these discussions, the debate still exists as to whether it is more efficient and practical to periodically survey or to develop continual surveys that may provide a wide sample of the variability of decisions and influences to travel.

As one key contributor noted, "even if we could quantify the economic and social factors that impact travel behavior, how could we predict economic and social change?" Developing a sound survey design approach and increasing the frequency of data collection and model validation efforts appears to be the common solution for overcoming unpredictable local and national socio-economic episodes.